Amendments to the Specification:

Please replace paragraph [0003] with the following amended paragraph:

[0003] Diffusion coatings, such as diffusion aluminides and particularly platinum aluminides (PtAl), and overlay coatings, particularly MCrAlX alloys (where M is iron, cobalt and/or nickel, and X is an active element such as yttrium or another rare earth or reactive element), are widely used as environmental coatings for gas turbine engine components. Ceramic materials such as zirconia (ZrO_2) partially or fully stabilized by yttria (Y_2O_3), magnesia (MgO) or other oxides, are widely used as TBC materials. Used in combination with TBC, diffusion aluminide and MCrAlX overlay coatings serve as a bond coat to adhere the TBC to the underlying substrate. The aluminum content of these bond coat materials provides for the slow growth of a strong adherent continuous aluminum oxide layer (alumina scale) at elevated temperatures. This thermally grown oxide (TGO) protects the bond coat from oxidation and hot corrosion, and chemically bonds the TBC to the bond coat.

Please replace paragraph [0004] with the following amended paragraph:

[0004] Suitable processes for depositing MCrAlX coatings include thermal spraying such as plasma spraying and high velocity oxyfuel (HVOF) processes, and physical vapor deposition (PVD) processes such as electron beam physical vapor deposition (EBPVD), magnetron sputtering, cathodic arc, ion plasma, and pulsed laser deposition (PLD). PVD processes require the presence of a coating source material made essentially of the coating composition desired, and means for creating a vapor of the coating source material in the presence of a substrate that will accept the coating. Figure 1 schematically represents a portion of an EBPVD coating apparatus 20, including a coating chamber 22 in which a component 30 is suspended for coating. An overlay coating 32 is represented as being deposited on the component 30 by melting and vaporizing an ingot 10 of the desired coating material with an electron beam 26 produced by an electron beam gun 28. The intensity of the beam 26 is sufficient to produce a stream 34 of vapor that condenses on the component 30 to form the overlay coating 32. As shown, the vapor stream 34 evaporates from a pool 14 of molten coating material contained within a reservoir formed by <u>a wall 18 of</u> a crucible 12 that surrounds the upper end of the ingot 10. Water or another suitable cooling

medium flows through cooling passages 16 defined within the crucible 12 to maintain the crucible 12 at an acceptable temperature. As it is gradually consumed by the deposition process, the ingot 10 is incrementally fed into the chamber 22 through an airlock 24.

Please replace paragraph [0007] with the following amended paragraph:

[0007] The present invention is a PVD process and apparatus for depositing a coating from multiple sources of different materials. The process and apparatus are particularly intended to deposit a nickel-base intermetallic coating, such as the gamma prime phase γ'[Ni(Co,Fe,Cr,Mo,W,Re)$_3$Al] ~~gamma phase (γ[Ni(Co,Fe,Cr,Mo,W,Re)])~~ or beta phase (βNiAl), which is alloyed to contain zirconium, hafnium, yttrium, cerium and/or another reactive element whose vapor pressure is significantly lower than the constituents of the nickel-base intermetallic. According to the invention, a different evaporation rate for these reactive elements is necessary to achieve higher deposition rates and better control of the coating chemistry.

Please replace paragraph [0008] with the following amended paragraph:

[0008] The PVD apparatus and process of this invention entail providing at least two passages through which at least two materials are fed into a coating chamber, and means for melting each of the materials to form molten pools thereof. A first of the materials has a composition with a higher vapor pressure than a second of the materials, and the melting means is operable to melt and evaporate the first and second materials at different rates. Finally, the apparatus includes means for suspending an article within the coating chamber. As a result of the presence of two separate molten pools, a nonhomogeneous vapor cloud is present within the chamber, necessitating that the article is transported relative to the two molten pools in order to deposit a coating with a controlled composition that is a mixture of the materials.

Please replace paragraph [0023] with the following amended paragraph:

[0023] In an investigation leading to this invention, beta-phase NiAl-based coatings were deposited onto six sets of buttons made from the single-crystal superalloy known as René N5 ~~Ren é N5~~. The targeted composition

for the coatings was, in atomic percent, about 40 to 48% aluminum, about 5% chromium, and about 0.1 to 1.2% zirconium. The EBPVD process used to deposit the coatings used an ingot of NiAlCr that was continuously melted and evaporated by one electron beam, while an ingot of zirconium was continuously melted and evaporated by a second electron beam. In this manner, ingot chemistry was used to obtain the relative desired levels of nickel, aluminum and chromium, while the electron beam parameters were adjusted to vary the zirconium content from one button set to another. During the coating process, the buttons were transported through the vapor cloud in a manner similar to that represented in Figure 2. The coatings were deposited to a thickness of about 2 mils (about 50 micrometers), after which the coated buttons were subjected to a vacuum diffusion heat treatment at about 1975°F (about 1080°C) for about two hours.

Please replace paragraph [0024] with the following amended paragraph:

[0024] On a second set of <u>René N5</u> ~~Ren é N5~~ buttons, NiAlCr+Zr coatings with compositions of, in atomic percent, about 47.4% aluminum, about 5% chromium, and about 0.2-0.4% zirconium were deposited to thicknesses of about 2 mils (about 50 micrometers) using a high velocity

oxyfuel (HVOF) thermal spray process. The buttons were diffusion heat treated at about 1975°F (about 1080°C) for about two hours in a vacuum, after which their NiAlCr+Zr coatings were subjected to surface grinding to improve their surface finishes to below 100 microinches (about 2.5 micrometers) Ra, such that the HVOF coatings had surface finishes and coating thickness uniformity comparable to the EBPVD coatings.

Please replace the paragraph in the Abstract of the Disclosure with the amended paragraph submitted herewith on a separate sheet pursuant to 37 CFR 1.72.